COMMENTS ON DRAFT RI REPORT

General Comments

1. The RI report has suggested that the wood chips found at various places are from historical lumber operations in the area. The coal gas manufacturing process utilized scrubbers and purifiers to remove tar and other residuals from the gas. Wood fibers/chips were utilized in the scrubbers to absorb tar and other residuals. Wood chips were also utilized in the purifiers as sorbent to trap some tar and other residuals. Due to close proximity to lumber operations it is quite likely that the process at the Ashland/NSP site utilized wood chips in their scrubbers and purifiers. The wood chips utilized in the scrubbers and purifiers would eventually load up with tar and other residuals and become unusable. At this point this material would require disposal. Many times the waste materials from MGP facilities were used for filling low lying areas by MGP facilities. At the Ashland/NSP site NAPL appears to be associated with the wood chips at several locations, suggesting that the NAPL source associated with the wood chips could be from disposal of wood chips from the MGP at the Ashland NSP site.

Response

It is correct that certain coal gas manufacturing processes utilized the appurtenances described. The coal gas process generated a type of waste called scrubber and purifier box waste that consisted of high concentrations of nitrogen bearing cyanide and phenolic compounds. These wastes are commonly found as wood chips from purifier boxes. However, at the Ashland site, the MGP process utilized was not coal gas but water gas. The water gas process did not produce high levels of nitrogen bearing compounds, as confirmed by low levels of cyanide and phenols in the various media analyzed since 1995. Additionally, wood waste residuals from scrubbers and purifiers have not been found at the former gas plant site despite significant investigation and excavation work, including the large series of excavations in the filled ravine during the clay tile investigation in 2001. A few isolated wood waste timbers were encountered during this clay tile investigation near the confluence of St. Claire Street and the filled ravine. It was generally accepted that these timbers were associated with the foundation that supported the bridge which previously crossed the ravine in the late 19th century before it was filled.

Wood waste at the Lakefront comprises the fill in the man-made area at Kreher Park as well as the estimated 25,000 cubic yards of wood waste confirmed in the affected sediments area. This material has been documented in historical records and confirmed by these investigations as derived from former lumber operations. There is nothing in the historical record or in the investigation data indicating any of this wood waste material originated from waste residuals from the gas plant. Additionally, the comment "At the Ashland/NSP site NAPL appears to be associated with the wood chips at several locations, suggesting that the NAPL source associated with the wood chips could be from disposal of wood chips from the MGP at the Ashland NSP site." *is purely speculative and not supported by any documentation currently in the record. To the contrary, the data developed regarding the source of NAPL associated with wood chips at the Lakefront, such as extremely high PAH levels not found in the NAPL at the gas plant site, as well as results of the forensic analyses of this NAPL, supports the conclusion that NAPL*

encountered at the Lakefront is a remnant of wood treatment associated with former lumber operations

2. In the RI report for nature and extent of contamination the average and 95 percent Upper Certainty Limit (UCL) are compared to the Region III RBCs, Region IX PRGs and Wisconsin standards. The procedures utilized for the extent of contamination are not appropriate. For extent of contamination all analytical results should be compared to the regulatory standards and the samples exceeding any regulatory standards should be utilized to determine extent of contamination.

Response

USEPA agreed to submittal of the RI as well as historic data in summary tables to minimize the volume of information as part of the formal RI report. USEPA further confirmed via email on March 21, 2006 that due to the massive amount of data, all historical RI information could be submitted electronically in lieu of paper submittals. This agreement was documented in the April 2006 monthly report as "USEPA also notified NSPW that an electronic deliverable of the entire summary of historic analyses data in its existing Access Database format would be acceptable as part of the RI Report. The Agency also agreed to receive hard copy summary tables of historic data by matrix (i.e., soil, sediment) and domain (i.e., Upper Bluff, Kreher Park) as part of this submittal." Consequently, *the entire historic data summary of individual sample results were submitted electronically as described.*

The submitted report format included a series of tables summarizing the results of compound analyses within each domain, displaying the number of samples analyzed, number of samples detected, percent detected, mean, maximum, second maximum, location of the maximum, 95 percent UCL, and a series of standards including the published Wisconsin, Federal maximum contaminant level (MCL), Region 3 and Region 9 standards. The federal standards were provided because several compounds historically analyzed have no corresponding Wisconsin standards. Based on the volume of data generated during the RI and during previous phases of investigation, the statistical methods utilized to evaluate the data were considered appropriate to provide USEPA a data record and a means of interpretation that can be relied upon for risk management decision-making. There are more than 51,000 individual compound data entries for groundwater and more than 65,000 individual compound entries for soil and sediment in the existing database. These statistical summaries provided an acceptable means of analyzing and presenting the large data sets found at the Ashland site.[1]

Despite this previous understanding, USEPA indicated during a meeting with NSPW on October 12, 2006 that the submittal of summary tables by domain would now not be acceptable as a means to describe the nature and extent of contamination for the final RI report. However,

[1] *This approach has been accepted in RI submittals for Region 3.*

USEPA acknowledged during this meeting that a separate comparison of all compounds to standards would not be necessary. The Agency agreed that many compounds analyzed historically had been shown not to be significant contaminants, and such a presentation of all compounds would be unwieldy. The Agency further agreed to provide NSPW a list of selected compounds by matrix to which individual tables should be prepared comparing the sample and associated analyte to the appropriate regulatory standards. These tables would be accompanied with figures showing the extent of contamination along with a corresponding discussion.

USEPA provided NSPW the above-described list of soil and groundwater compounds to prepare these tables on October 18, 2006. USEPA's list included the corresponding number of exceedances. However, the specific standards to which these numbers corresponded (e.g., Wisconsin residential, Wisconsin industrial, Region 3, Region 9, etc.) were not provided. Many of the selected compounds were analyzed early during the investigations (e.g., TCE) and have a very small database. Continued sampling for these parameters was discontinued before the 2005 RI investigations because it was determined these compounds were not associated with contaminant sources at the site.

As a result, NSPW and USEPA must have further discussions concerning this list prior to finalizing the selected parameters.

3. The fate and transport of contamination cannot be completely evaluated because the RI report has compared the regulatory standards to 95% UCL and average concentrations.

Response

Statistical summaries of large data sets show the overall trend and allow for a correct interpretation of the results without being influenced by individual data outliers. That is why the 95% UCL and average values were compared against one another and to regulatory standards where large data populations exist.

As described in the response to General Comment 2, NSPW will prepare individual compound tables by sample for a selected group of analytes for the final draft RI report. However, the summary tables submitted with the previous report draft and a discussion of the statistical interpretation will remain in the revised document because it is a valuable means of displaying the data.

4. The extent of contamination and conceptual model should address wood chip process waste described in Comment 1 above.

Response

As stated in the response to Comment 1, there has been no finding or historical record of wood waste associated with scrubbers or purifiers at the Ashland MGP site. There has also been no finding or investigation data that indicates that any of the wood waste found at Kreher Park and in the sediments originated at the gas plant. On the contrary, historical records indicate that wood waste at the Lakefront is associated with former lumber operations, and when coupled with all other evidence, suggests that wood treatment by those former lumber operations contributed to contamination at the Lakefront.

5. Previous investigation carried out by Northern States Power of Wisconsin (NSPW) and WDNR produced a significant amount of analytical information. Field work conducted under this investigation was based on a data gap analysis and the purpose was to "fill in the gaps" to complete the RI and FS. The Draft RI and supporting documents seem to focus on 2005 data and do not incorporate the historic baseline information. Past work conducted in completing the Ecological and Human Health Risk Assessment and past analytical results should be assimilated into this document.

Response

The past data was assimilated in the draft RI report in addition to the significant amount of data generated in 2005 and utilized in the RI Report. Overall the 2005 data supports previous site investigation results. Regardless, the use of the statistical summaries as described in our responses to General Comments 2 through 4 incorporated this historic data into the RI report. As described above these statistical methods were utilized to specifically include all the data in the evaluation of the nature and extent of contamination. As stated in the separate responses to the Ecological and Human Health Risk Assessments, the previous SEH risk assessment data was utilized for these reports. It is incorrect to state that past data was not utilized.

The foundation of the RI Report should be our understanding of the site conditions and should be reflected in the conceptual site model. The historical sources of contamination, contaminant transport and distribution patterns need to be clearly and accurately portrayed in the model. Although some minor other sources may have contributed to the site contamination, the major source of site related contaminants is the historic operation and waste disposal practices of the manufactured gas plant. Clear reference to discharge through the ravine prior to filling and later through the pipe systems needs to be addressed.

Response

The conceptual site model description in Section 6 clearly describes the discharge of free-product from the gas plant through the pipe network via the buried clay tile and the transfer pipe found along the bluff face. It also states that the investigation data indicates it likely was

connected to the open sewer, which in turn discharged to the inlet area. The model uses the statistical summaries to show a contaminant distribution pattern linking contaminants between the gas plant and the affected sediments. However, the model/distribution pattern also uses the data to show that other sources are evident. The model explains how historic site use, including MGP operations, resulted in Site contamination without dismissing other contaminant sources as minor. Please note that the conceptual site model addresses all sources in a factual manner without addressing the relative contribution of each. As discussed at the October 12th meeting, the CSM will be revised to incorporate the findings of the SSA report.

- Contaminant volume estimates are referred to throughout the RI report as well as in the support documents. What were the methods used and where are the calculations that support these estimates? Specifically, any volumetric estimate needs to consider what contaminant concentration is indicative of NAPL, the size of the areas and percent of pore space containing free product vs. water.

Response

NAPL volume estimates are described in Section 5.3, Contaminant Distribution and Trends. This section also references the GTI calculations that are cited in the approved Work Plan. A specific reference to this document will be added to the revised RI draft for further clarification. No new information was obtained during the 2005 RI site work to dispute the previous calculations for NAPL volumes.

- It appears as if the RI failed to address all of the manufactured gas plant wastes on the site and this need to be discussed. The expected waste streams need to be presented to allow the reader to understand the site contaminants. What waste products were generated during the production process? How were the waste products handled, stored or disposed of? What was the nature of the waste, liquid, ash or solid? Where was waste from the buildings disposed of? How much of the wastes were used to fill in the ravine and or Kreher Park?

Response

The SOW, approved work plan and the RI guidance clearly describe the requirements for the RI report. These include a description of key contaminants, areal extent, depth, persistence and mobility. The historical sources and disposition of contaminants are also described. The information discussed in this comment was provided to the extent possible based on available historic information and data developed since 1995. However, the purpose of the RI report is not to describe the manufactured gas process at the Ashland plant. That information has been provided in previous documents and referenced in the approved work plan. One such reference is Appendix D in the Remedial Action Options Feasibility Study – Final Report for the Ashland Lakefront Site, prepared for Northern States Power, Ashland, Wisconsin for NSP (D&M, March, 1999).

- The primary contaminant source for this site is the MGP. Free product MGP liquid wastes have migrated from the site through both man made and natural conduits. The transport mechanism from the surface to the Copper Falls aquifer has not been determined. It may have been downward migration through the soils or through a man made conduit (i.e.: excavation or piping). Discharges to the ravine have caused free product to be present throughout the length of the ravine. The transport mechanisms need to be corrected in the RI report. Soil boring advanced by NSPW; B-1, B-20, B-21, and B-22 (Dames & Moore August 1, 1995) all encountered free product within the ravine north of St Claire Street. Transport to the historic lake bed and Kreher Park were through the ravine and then through pipes and the ravine fill. Many pipes have been found during the various phases of investigation, some may have been removed prior to the investigations taking place. The Greeley & Hanson drawings of record note a pipe leading from the MGP to the "Tar Dump". That pipe was not found during the investigations and may have been removed prior to investigation.

Response

Details regarding migration pathways for free product found at all the affected areas (Copper Falls Aquifer, Filled Ravine, Kreher Park and the affected Sediments) are described in Section 5.2 Potential Routes of Migration/Contaminant Transport Processes. This section defines free product in the Copper Falls Aquifer and the Filled Ravine as having originated at the gas plant. The opening sentence in the second paragraph in this Section is "The MGP is considered a primary source of contaminants at the Site." *This section describes that the likely pathway to the Copper Falls is in the area of the alley where geologic conditions are conducive for migration, since the confined conditions north of this area restrict downward flow migration. There is no evidence of an intentional man-made conduit (i.e. injection well), although excavations for foundations in this area may have exacerbated the migration potential. The extent of free-product in the Filled Ravine is also detailed. It includes a description of the extent of free-product measurements in the ravine during the initial investigations through the 2005 RI. It also describes how free-product was not measured north of St. Claire Street until after the excavation for the buried clay tile during 2001. Subsequent information to the 1995 investigation (including the 2001 clay tile investigation) confirmed the identification of "coal tar" in those 1995 borings was not correct; this material was actually stained fill soil. Representatives of NSPW and the WDNR on site during the 2001 investigations observed that free-product was identified within the buried clay tile encountered at the base of the backfilled ravine north of St. Claire Street, but not* "present throughout the length of the ravine."

Discharges to Kreher Park via the pipe network including the clay tile and the pipe found along the bluff face as well as the open sewer are also described in Section 5.2. A reference to the "two-inch tar to former dump" pipe identified on the Greeley and Hanson drawings is also made. The transport mechanisms described are thorough and accurate based upon the level of information available. No corrections are necessary.

- It appears that sometime after the closure of the Schroeder Lumber Company's operations (1930) a waste tar pond started to form near the mouth of the ravine. Tar dumps were not uncommon at carbureted water gas plants and were used as a method to decant the water and lighter volatiles off of the heavier tars. The layout of a pipe to a waste tar dump, the dump area itself and a culvert from the dump area to the lake is consistent with this scenario, fits the drawings of that time, and is supported by the visual and analytical results of the investigations. Further, this scenario fits many of the eye witness observations and fits into the timeline of those eye witnesses.

Response

Schroeder Lumber continued to operate after 1930. There is no evidence to support this comment's assumption that a waste tar pond formed after the close of Schroeder's operations. Contrary to the last statement in this comment, eyewitness testimony refutes these assumptions. This comment implies that the coal tar dump area identified on the 1953 Greeley and Hanson record drawings, and the associated features associated with the dump (including the culvert shown on the drawings and potentially found in the test pit investigation during the RI) were part of the active gas plant facility. This assumption would require that Lake Superior District Power (the owner of the plant after 1930) would have necessarily operated this "decant facility" on Schroeder Lumber property until 1939, county property until 1941, and city property until the gas plant ceased operations in 1947. There is no documentation to support this comment's assumptions; actual evidence conflicts with this comment.

- The use of the average and 95% UCL should be dropped and the actual results should be applied throughout the documents.

Response

Please see responses to General Comments 2 and 3 above.

- An attempt needs to be made to reflect that wood waste has been deposited on top of the contamination within large areas of the lakebed. A sediment map should address the contaminant concentration and areas where free product has been noted without tying it to the depth of the wood waste on top of it.

Response

There is no evidence either in the physical data collected or historical information that the wood waste found across the affected inlet was deposited on top of the contaminated sediments. Contaminated materials as well as wood waste were likely intermittently deposited over a significant period of time, but the mode of deposition of the wood waste is a subject for the Sediment Stability Assessment (SSA) report, not the RI report. Figure 2-5 in the SSA report

shows the wood waste layer thickness. Figures 4-23 through 4-27 are contaminant distribution maps for VOCs and PAHs provided in the RI report. Contaminant isocon maps for PAHs previously prepared for a 2001 sediment report are included in the approved work plan.

It was agreed during the October 12th meeting that the sediment stability conceptual site model described in the SSA report, which was restricted to a physical deposition model, will be incorporated into the conceptual site model described in the RI report.

- The RI attempts to minimize the areas containing free product in Kreher Park. Given that all but 2 of the 2005 test pits in Kreher Park indicate the presence of NAPL please explain why the figures and narrative do not reflect that? Any map or discussion of NAPLs in an area needs to reflect all of the sampling (including test pits) conducted in that area over all of the investigation phases.

Response

The RI describes free-product in terms of heavy-weight DNAPL identified in borings and monitoring wells. It also describes LNAPLs visible as sheens in test pits, but relies on associated groundwater analyses data to confirm if DNAPL is present by means of detected VOCs concentrations. As described at the October 12th meeting this depiction relies on the consistently reproduced condition that shows the presence of DNAPL when total VOC concentrations approach 50,000 µg/l in groundwater. Although sheens were observed in test pits as described above, corresponding groundwater samples from adjacent wells have yielded total VOC concentrations below 4,000 µg/l The narrative will be revised and figures added to describe the observed sheens.

6. For depicting extent of contamination, several figures have been developed in the RI. The figure has depicted extent of contamination using ranges of concentrations. The range of concentrations has been randomly picked. Normally to depict extent of contamination on the figures the samples are compared to regulatory standards and the results exceeding regulatory standards are utilized to depict extent of contamination for each media.

Response

The ranges shown on the figures are arbitrary but were selected to show distribution patterns and the lateral and vertical extent of contamination. These patterns will be maintained, but the figures will be revised to show regulatory standard exceedances as needed. Please see also the response to General Comment 2.

7. For depicting extent of contamination include tables comparing constituents detected with the regulatory standards.

Response

Please see the response to General Comment 2.

8. The report indicates that the volume of coal tar generated during the life of the MGP is significantly less than the volume in the sediments. Section 4.1.3 states that observations of free product in the sediments have not been as accurately measured, due to limited offshore sampling methods. Therefore, what assumptions were used to generate these two numbers and where are they documented?

Response

The volume calculations for tar generation during the life of the gas plant are referenced in Section 1.2.2 Site History, footnote 9. The volume calculations for free-product present in the sediments are referenced in Section 5.3 to the previous work performed by the Gas Technology Institute.

Specific Comments

1. Section 1.2.2, Site History: The site history currently starts with the history of the Kreher Park area. While the Kreher Park narrative is important, it may cause confusion since the historic MGP is a major source of contaminants at the site. It would seem the historic operations of the MGP should start the site history section and the narrative should move through the site from that point.

Response

Both areas are equally described. The SOW, the approved work plan and/or the RI/FS guidance does not contain specifics regarding the order of description of historical features. The filling of the Lakefront and the onset of industrial operations (including the MGP) were contemporaneous. The sequence will be reordered to proceed across the site geographically from south to north per the Agency's request

The Kreher Park history should be based on documented evidence. While "eye witness" accounts may suggest a recollection of a tar pond and wood treatment taking place in the area, there are contradictory eye witness reports that suggest wood treatment did not occur. Further, the analytical results from these investigations do not yet support wood treatment taking place. It can be mentioned in the narrative that wood treatment may have taken place but this has not been substantiated.

Response

The commenter is referred to the Ashland/NSP Lakefront Site PRP Investigation Report submitted to USEPA in June 20, 2006. This document contains a detailed description of historic activities completed at the Lakefront, which are supported by forensic soil sample results collected during the RI.

It is clear from newspaper articles that the John Schroeder Lumber Company saw mill ceased operations around 1930.

Response

A review of newspaper articles from the period confirms the following:

- "Currently 20-60 men working. Additional men hired to work through the summer in and about the mill." *(Ashland Daily Press, 6/6/31);*
- "Company is putting the property in order, removing antiquated tramways and cleaning up the shop." *(Ashland Daily Press, 1/20/37);*
- "County recently took tax deed on 1/2 of the property." *(Ashland Daily Press, 6/15/39).*

The MGP history does not discuss the 1902 City Ordinance requiring MGPs within the city to convey their wastes underground. In light of the ordinance, it would seem appropriate to include a discussion of how material waste was conveyed and how that might tie to the 12" clay tile pipe.

Response

The 1902 sewer ordinance is discussed in Section 5.2 Potential Routes of Migration/Contaminant Transport Processes and again in Section 6.0 Conceptual Site Model. Both sections clearly describe the waste conveyance mechanisms through the pipe network. It is unnecessary to include this information in the history discussion.

The history section should include a discussion of the information obtained from the Browns Directories and the Wisconsin Railroad Commission documents.

Response

See Section 1.2.2, footnote 9 in the draft RI report.

2. Section 3.1 - *Regional and Site Geology*: The Miller Creek Formation thins to 4 foot thick at the base of the ravine not 7 as noted in the narrative.

Response

The 7-foot thickness was based on an interpretation of the boring logs at the MW-5 well nest. The commenter is requested to provide justification for this revision.

As documented in excavations and borings the ravine fill materials consist of both liquid and solid MGP wastes.

Response

Agreed.

It should be stated that surface water at the seep contained dissolved phase and free product MGP wastes rather than "elevated concentrations".

Response

Surface water at the seep was observed to contain sheens. Consistent with the response to the final bullet of General Comment 5, the narrative be revised to describe these as sheens in lieu of free-product.

It should be stated that the 12" clay tile pipe was acting as a conduit for the transport of both dissolved phase and NAPL from the MGP to the seep area.

Response

The narrative will be revised accordingly.

Some discussion of the interaction between the lake level and the water levels within the lake bed fill of Kreher Park should be included.

Response

A discussion of this interaction is included in Section 3.2.2 Site Hydrogeology regarding the well nests MW-24, -25 and -26 along the shoreline. This discussion will be augmented.

3. Section 3.2: In this section it is stated that fill in the ravine includes ash, cinders, steel and wire. Wood chips were also found at several locations in the upper bluff. Revise this section to address wood chips.

Response

The narrative will be revised to describe the material as it was found in exploration borings and test pits. However, significant volumes of wood have not been encountered at the upper bluff. As described in the response to General Comment 1, a few wood timbers (not of MGP origin) were encountered in the backfilled ravine near St. Claire Street during the 2001 excavations, presumably associated with a former bridge located in this area.

4. Section 3.2 – *Surface Water Hydrology:* It should be noted in the narrative that although it is not known whether the MGP, the City or others installed the clay tile pipe system, contaminants consistent with the MGP wastes have been detected along the full length of clay tile pipe and open sewer to the lake.

It appears that the mode of contaminant transportation to the lake included discharge through:

- From the MGP through the ravine to the lake prior to the lake bed fill covering the mouth of the ravine;
- From the MGP through the 12" clay tile pipe either to the lake bed prior to filling and/or through the extended piping system towards the open sewer;
- Through the 2" pipe to the waste tar dump as depicted in the Greeley & Hanson drawings of record, then through the culvert to the lake or;
- Other possible scenarios.

Response

As discussed in previous responses, the transport mechanisms via the pipe networks are discussed in Sections 5.2 and 6.0. This transport mechanism is documented per the identification of the clay tile and associated clay pipe network and open sewer. It is also documented per observations made during those investigations as well as analytical data. The discharge of free product through the ravine directly to the lakebed prior to filling has not been corroborated either by historical evidence or investigation data. Similarly free product discharge through the 2" pipe has not been documented. As described in the 1999 Lakefront Site Feasibility Report (D&M, 1999) *and described in Section 5.2 of the draft RI report, forensic analyses on a section of pipe believed to be the 2" tar pipe yielded no evidence of residual hydrocarbons.*

5. Section 3.4: This section needs to be revised once the sediment stability report has been finalized.

Response

Agreed.

6. Section 4: This section does not include a table that lists the comparison criteria for each detected contaminant by media. The comparison criteria are included in the various statistical summary tables; however, this does not present a comprehensive list in one location. It is suggested that such a table be included in the RI.

Response

Please see the response to General Comment 2.

7. Section 4: This section presents data in terms of means and 95% UCLs. This is not a typical approach to a RI and does not present an accurate nor complete picture of the contaminant distribution. In many instances, the 95% UCL has been calculated from datasets with as little as one detection. This approach is not acceptable because it provides a skewed result to the reader because sample results are diluted. Each soil, sediment, and groundwater data point has not been directly compared to regulatory standards and then presented. The statistical approach for determining extent of contamination should not be utilized.

Response

As described in responses to General Comments 2 and 3 above, the statistical evaluation is an appropriate method for large data sets. Only in rare examples where few compounds were detected (for compounds that are not primary contaminants analyzed early in the investigations) are data sets limited.

8. Section 4.1.1 – *Ravine Fill:* This section presents the results of the geoprobe investigation of the fill in the vicinity of the NSPW Garage. Based on the boring logs in Appendix B, the information on Table 4-1 and Figure 4-1, the extent of free product contamination has not been defined. The following are comments relating to the extent of free product determination in the ravine fill:

- GP105, GP112, GP121, GP132, GP135, and GP136 either refused at a shallow depth, or were terminated at a relatively shallow depth. Based on the observations of the surrounding borings, it is likely that the depth of the free product was not reached in this list of borings. The result is that the lateral and vertical extent of contamination cannot be determined at these locations. In particular, this focuses on the southwest portion of the free product delineation as shown on Figure 4-1.

Response

These delineations were determined not only from the results of geoprobe borings but other information from previous drilling. The lateral and vertical extent of the ravine has been well-documented per the investigations associated with this drilling. The area near GP-105 and -112

also were near historic borings B-23, B-13 and MW-12, where free-product was not encountered. For borings GP-132, -133 and -135 through -137 advanced on the southwest portion of the free-product area, only -135 met refusal. The other borings were terminated in natural fine-grained silty clay west of the west-flank of the ravine. Although free-product may yet be present in isolated areas in the ravine fill that has not been fully documented, it is NSPW's opinion that further investigation in this area is unnecessary for purposes of evaluating remedial actions.

These other historic borings will be added to Figure 4-1.

- Free product was identified at both GP116 and GP117; however, borings have not been advanced to the west of these locations. Therefore, the western extent of free product has not been delineated.

Response

Boring B-26 was advanced in 1998 west of the west flank of the ravine approximately 30 feet west of GP-117. It was advanced to a maximum depth of 11.5 feet in silty clay. It will be added to Figure 4-1.

- Boring GP131 is identified on Table 4-1 as containing free product; however, it is not included within the green line on Figure 4-1.

Response

The boring log for GP-131 indicated a trace of free product was found from 6 – 8 feet. The Figure will be revised.

- The southern extent of free product contamination has not been defined. GP131, GP134 and GP128 indicate the presence of free product; however, no borings south of these locations have been advanced.

Response

The southern terminus of the historic gas holders corresponds to this line of Geoprobe borings. Boring GP-138 was advanced to a depth of 12 feet about 65 feet south of GP-131 along the axis of the ravine and no product was encountered. Boring B-35 was advanced in 1998 about 40 feet southeast of GP-128 on the east flank of the ravine and no free-product was encountered. Figure 4-1 will be revised to include these borings. NSPW believes that for purposes of evaluating remedial actions, no further investigation is necessary.

- Free product was identified in GP107; however, this point has not been included

within the green line on Figure 4-1. Additionally, to the east of this area, the extent of free product has not been defined (east of GP106 and GP107).

Response

Boring GP-107 encountered free-product from 6 – 8 feet. The Figure will be revised. Additionally Boring B-27 was advanced in 1998 on the east flank of the ravine about 22 feet southeast of GP-108 (approximately 20 feet west of GP-118) to a depth of 9 feet. No product was encountered. The figure will be revised to include this boring information. NSPW believes that for purposes of evaluating remedial actions, no further investigation is necessary.

- The extent of free product cannot be fully assessed at GP103.

Boring B-31 was advanced in 1998 about eight feet southeast of GP-103 to a depth of 9 feet. Total PAHs of 6,000 – 1,000 ppm were found at 4 feet and 9 feet, respectively. GP-101, advanced 15 feet northeast of GP-103, did not encounter free-product. This area is outside the ravine but is likely the site of an historic discharge where free-product is confined to an isolated zone at the top of the Miller Creek Formation. Boring B-32 was advanced in 1998 about 45 feet northeast of GP-101 to a depth of 19 feet; no product was encountered. The MW-8 well nest was installed in 1996 approximately 50 feet north-northwest of GP-101; no product was encountered. Because of access restrictions, further delineation at the GP-103 boring is problematic. Although remedial options have not been decided, the geologic conditions confirming this area is outside the ravine, along with the data developed to date indicate that the remedial alternative will likely be a limited removal action. NSPW believes that further delineation in this area is not needed.

Based on the above bullets, it is likely that additional investigation will have to be conducted prior to designing any remedy in order to fully delineate the extent of free product in the upper bluff/ravine area.

Response

NSPW does not believe that further delineation of product source areas at the upper bluff will affect decision making during the FS process. If supplemental information is needed prior to remedial action, that information should be obtained during remedial design following issuance of the ROD.

Therefore, more discussion is needed regarding the free product that was encountered over the full length of the ravine from the MGP (alley) to the mouth of the ravine. This has been documented through soil borings conducted by Dames & Moore (now URS) in 1995. (Borings B-1, B-20, B-21 and B-22)

Response

Please see the response to the third bullet of General Comment 5 above.

In addition, more discussion of the role the 12" clay tile pipe played in contaminant transport needs to be added.

Response

The role of the 12' clay tile in contaminant transport is thoroughly described in Sections 5.2 and 6.0.

9. Section 4.1.2 – *Kreher Park*: The text in Section 3 indicates that the test pit investigations found free product to be extensive throughout Kreher Park. In addition, historic test pits excavated throughout the park indicated free product of both LNAPL and DNAPL. Free product was not isolated and was found in all but 2 of the 2005 test pits. This section needs to at least summarize the results from the test pit investigations, and draw an overall conclusion regarding the extent of free product contamination.

Response

Please see the response to the final bullet for General Comment 5 above. The text in section 3 will be revised to be consistent with the descriptions in Section 4. However, NSPW believes that the potential presence of DNAPL is confirmed by the corresponding groundwater concentrations. Groundwater samples collected from areas in proximity to the sheens show low levels of VOCs that are more than an order of magnitude less than those collected from the seep area and well TW-11, where DNAPL was confirmed. This finding is critical to the assessment of the extent of contamination at the Park.

10. Section 4.1.2 – *Kreher Park*: The text indicates that free product has been delineated in both the area to the north of the seep, and in the area of TW-11. North of the seep, free product has been encountered in most of the borings advanced in this area. Borings outside of this free product area have not been advanced to prove that the free product is limited to the outline shown on Figure 4.2. Therefore, the extent of the free product north of the seep has not been delineated, and it appears that further sampling is likely to be needed during design to define the extent of (this) free product.

Response

Sampling was completed in accordance with the work plan. Although free product was encountered as DNAPL in the majority of the Geoprobe borings, it was not encountered in GP-157, along the northerly-most line of these borings, or GP-149 along the southerly-most line (see

Table 4-1; GP-149 encountered refusal at eight feet. However, Figure 4-2 is in error and will be revised). As at the upper bluff, NSPW does not believe that further investigation will affect the remedial decision process in the FS; supplemental information can be obtained if needed after the ROD.

With regard to the assessment of free-product as sheens observed in test pits, NSPW believes the groundwater data from wells and Geoprobe/Hydropunch samples collected at Kreher Park is an accurate indication of the extent of contamination at the Park area.

11. Section 4.1.2 – *Kreher Park*: Near TW-11, Figure 4-2 shows GP146 to be outside of the free product zone; however, based on Table 4-1, GP146 contained free product, and as such should be included inside the blue outline. The extent of free product has not been defined in this area, based on the presence of free product at the outermost borings: GP139, GP144, and GP146. Although this area may have access considerations that may limit sampling, it appears that further sampling is likely to be needed prior to designing any remedy to define the extent of free product.

Response

Free product was not encountered in GP-140, the westerly-most boring or GP-145, the easterly-most boring. All the free-product encountered at the TW-11 area was DNAPL at the sediment/ wood waste layer interface, with the exception of GP-146 which noted free-product at three feet in the wood waste. Access restrictions to the south and north were documented in the report. The northerly boundary is defined at GP-139 (the shoreline) and GP-144 (the WWTP features). The free-product noted at GP-146, approximately 20 feet north-northwest of GP-145, is likely from a different origin than the DNAPL measured at TW-11 or found in the other borings. It is likely similar to the other sheens observed at Kreher Park discussed in the RI report and responses to previous comments.

NSPW believes that further investigation for this free-product source area will not affect decision making in the FS.

12. Section 4.1.3 – *Sediments*: It needs to be clarified that most of the NAPL within the sediments appears to be associated with the pre-fill lake bed sands. Clean wood waste fill appears to have migrated over the top of the NAPLs.

Response

Please see the response to the fifth bullet to General Comment 5 above. Fifty-nine borings advanced with a two-foot sampler in 2001 in the affected area showed that the wood waste layer varies in thickness from a few inches to the north to as much as six feet in the southeast corner of the inlet. The highest levels of contaminated materials are near the base of this layer, but

several borings indicate that sediments overlie some of the wood encountered. This indicates that natural littoral movement (or man-made manipulation) of materials occurred. The mode of deposition is the subject of the Sediment Stability Assessment report. There is no data in the historic record confirming that free-product was discharged to sediments prior to filling of the lake bed with wood waste.

13. Section 4.1.4 – *Copper Falls Aquifer:* The free product evaluation in this section needs some clarification. Table 4-2 lists wells where free product has been encountered. One thing that is not explicitly stated in this section is whether or not each and every well was measured for the presence of free product. For instance, if MW-5A/5B were not measured for free product, then the presumption could be that free product might be located there and the extent would not be defined at this location. Please clarify.

Response

Not all wells have been monitored during each event for free product. The measurements for free product were based on experience as well as historic groundwater concentrations. The text will be revised accordingly.

14. Section 4.1.4 – *Copper Fall Aquifer:* There is no lateral control on the extent of free product to the east of MW-21A/B, roughly parallel to the bluff face. In this area, MW-20A is upgradient and MW23A/B is downgradient of MW-21A/B. The result is that this area has not been fully characterized with respect to the extent of free product.

Response

The following table has been prepared in response to this comment:

Well No.	*Top of Screen (msl)*	*Water Level (msl)*	*Top of Copper Falls Aquifer (msl)*	*Free product thickness (ft)**
10A	*593*	*624.18*	*607*	--
10B	*609*	*616.98*	*607*	*0.02*
19A	*596*	*613.66*	*600*	--
19B	*570*	*624.53*	*600*	--
20A	*610*	*616.47*	*615*	--
21A	*597*	*614.15*	*605*	*2.60*
21B	*590*	*615.26*	*605*	--
23A	*585*	*612.96*	*585*	--
23B	*565*	*613.04*	*585*	--

* Free product measurements correspond to greatest thickness, measured 12/15/03

This information was obtained from the cross-sections (Figures 3-4 and 3-6) and Table 4-2. Well nest MW 10 is approximately 90 feet to the southeast of MW-21, and MW-19 is about 135 feet northeast (parallel to the bluff face) from MW-21. Note that the water level at MW-19A is

about 0.5 feet lower than that at MW-21A, but the top of the aquifer at MW-19A is lower than at MW-21A (600 ft compared to 605). Free product has never been measured at the MW-19 well nest. As described in the text, the migration of product to the MW-10 and MW-21 well nests is not only because of horizontal flow from the source area, but also because of vertical flow and the configuration of the base of the Miller Creek aquitard; the low viscosity DNAPL flows at the base of the aquitard in response to the artesian pressures.

NSPW believes that further characterization of the free-product in the Copper Falls aquifer is unnecessary.

15. Section 4.2.1 – *Metals and Inorganics:* The statement following the bullets indicates that the arsenic (and lead) values represent urban background conditions. However, based on the data presented in the bullets, the upper bluff surface soil sample concentrations of arsenic are considerably higher than the arsenic concentrations in the background soil samples. The upper bluff arsenic concentrations can therefore not be attributed to background conditions. Arsenic is also associated with waste streams from MGPs.

Response

The statement to which this comment refers is as follows:

- *The average and 95 percent UCL for arsenic in background soils are 2.1 mg/kg and 2.9 mg/kg, respectively, compared to the Wisconsin residential RCL standard of 0.039 mg/kg. The industrial RCL standard is 1.6 mg/kg;.*
- *The average and 95 percent UCL for arsenic in the other upper bluff soils are 3.4 mg/kg and 6.6 mg/kg, respectively;*
- *The average and 95 percent UCL for arsenic in the filled ravine soils are 2.5 mg/kg and 3.6 mg/kg, respectively;*

It should be noted that the comment does not include the results from the filled ravine soils, which are essentially the same as the background soils. If arsenic originated at the gas plant then elevated levels would be expected in the filled ravine soils. Accordingly, the comparison with background confirms elevated arsenic levels are present throughout the Ashland area.

NSPW believes its statement regarding arsenic background conditions is correct.

16. Section 4.2.1 – *Organics:* The statement is made that the low levels of organics represent typical urban background conditions. However, the presence of VOCs and SVOCs that are directly related to the site contamination cannot be considered typical of background conditions.

Response

This section addresses contaminants in surface soil samples compared to background (for purposes of this discussion, the text also notes that background sample SS-24 was collected from fill near the edge of the filled ravine). The location of the soil background samples were approved as part of the work plan. They are within the Superfund site boundary but far to the west and east of the former gas plant. They were located in areas where natural soil is near the ground surface (i.e., not fill soil at the Lakefront).

The text clearly describes that the only low levels of VOCs were measured in background samples, and only toluene exceeded the standard (a reference to a QA review of this detection is provided). The text also states that no VOCs were measured in filled ravine surface samples, and only low levels were found in upper bluff (outside the ravine) samples. The text also notes that with respect to SVOCs, only slight exceedances for the heavy molecular weight (HMW) compounds were measured, both in background and filled ravine/upper bluff soils. These HMW compounds have very low standards, and are commonly found at levels exceeding these standards in urban environments due to anthropogenic sources (e.g. internal combustion) .

Conclusions of this section reflect these typical urban conditions for cities comparable to Ashland. NSPW believes the statements are accurate.

17. Section 4.2.1 – *Surface Soils:* It is difficult to understand the use of the average and 95% UCL. Please explain. Comments to the HHRA regarding surface soil sampling should be addressed in this section.

Response

References to the HHRA will be added in the revised draft. Comparison tables for compounds found in surface soil samples will be added in accordance with the agreement reached at the October 12th meeting. However, the use of the average and 95% UCL will remain (see response to General Comments 2 and 3 above).

18. Section 4.2.2 – *Subsurface Soils/Upper Bluff* – Metals and Inorganics and Figures 4-6 and 4-7: The arsenic concentrations shown on Figure 4-6 indicate that arsenic contamination has not been delineated. Sample GP-110 is identified to have a concentration of 4,000 mg/kg of lead; however, this sample is not shown on Figure 4-7. A figure has not been presented to identify the locations of the iron exceedances in the subsurface soil.

Response

The text describes that arsenic levels in subsurface soils are similar to surface soils. Higher levels of arsenic exist in subsurface soils outside the ravine than those found in soils within the

ravine. Regardless, these arsenic levels are higher than background levels. Naturally occurring levels of arsenic in excess of the regulatory standards are common in soils throughout northern Wisconsin.

As described in the response to a previous comment, arsenic has never been historically associated with the Ashland gas plant. Industrial arsenic cleanup standards as high as 20 mg/kg have been promulgated at other sites. The existing database (including the RI and historical data) indicates that further characterization for arsenic is not necessary.

Figure 4-7 will be corrected to show the lead level in GP-110.

Iron is a naturally occurring compound and was found across the study area, which is not unusual considering Ashland's proximity to historic iron mines in the nearby Gogebic Range. As shown in the Table 4-3, it exceeded standards in upper bluff, filled ravine and background soils. A figure will be added, but the text will reflect it is not a contaminant of concern at this site with regard to human health or ecological risk.

19. Section 4.2.2 – *Subsurface Soils/Upper Bluff* - Organics: The toluene detections do not appear to be comparable to the Wisconsin RCL. The one detection of toluene at 9,000 ug/kg is considerably greater than the RCL of 1,500 ug/kg; this is not comparable. This also indicates that there is likely to be toluene contamination in the background soils. This section also indicates that numerous VOCs and PAHs exceeded regulatory criteria; however, only benzene and naphthalene have been discussed. The RI must present and discuss all of the exceedances.

Response

The comment refers to the discussion in the text regarding toluene concentrations in background subsurface soils. As shown in Table 4-4, there were nine samples analyzed for toluene, three yielded detections, one a maximum of 9,300 µg/kg in a sample from GP-159, a sample from east of Prentice Avenue. The toluene measurements and the quality control issues identified during the RI have been discussed in monthly reports, and are detailed separately in Appendix F.4 .5 (see footnote 27).

The approved RI work plan included a list of nine VOCs (primarily BTEX compounds) and 24 SVOCs (PAHs) for study. Benzene and naphthalene are the primary organic constituents detected at the Ashland site, and represent the primary indicators of contamination from each group. Although other organic compounds have been analyzed during investigations prior to the RI, additional PAHs were supplemented and approved in QAPP Addendum 3 as part of the sediment investigation for purposes of ecological risk assessment. All data for these compounds are presented in the summary tables and compared against the various standards.

The text in Section 4 of the RI report was prepared in accordance with the approved work plan.

The work plan states in Section 4.4 (RI Report) the following:

"The objective of the report will be the accurate presentation of Site conditions with respect to contaminated media, extent of contamination, and fate and transport of contaminants. Key contaminants will be selected based upon persistence and mobility in the environment and the degree of hazard. These key contaminants will be evaluated for receptor exposure to estimate contaminant levels that may reach human or environmental receptors. Water quality standards, indoor air standards, soil cleanup standards, and any other appropriate criteria accepted by the EPA will be used to evaluate potential effects on human receptors exposed to contaminants above the appropriate standards and guidelines."

Benzene and naphthalene are considered the key organic contaminants as described above. However, per the agreements at the October 12th meeting, a select group of compounds along with the respective regulatory exceedances will be described for the associated media. The final parameter list and the associated standards will be confirmed during future discussions between NSPW and USEPA (please see also the response to General Comment 2).

20. Section 4.2.3 – *Surface Soils/Kreher Park* – Metals and Inorganics : The text indicates that iron was found to exceed a Wisconsin RCL; however, a figure of iron exceedances has not been presented. Therefore, the extent of iron contamination can not be evaluated.

Response

Please see the response to Specific Comment 18 above.

21. Section 4.2.3 – *Surface Soils/Kreher Park* – Organics: This section needs to address each of the PAH constituents that were found to exceed regulatory criteria.

Response

Please see the response to Specific Comment 19 above.

22. Section 4.2.4 – *Subsurface Soils/Kreher Park:* We do not agree with the statement that *"This disparity between PAH concentrations between the upper bluff/filled ravine and Kreher Park soils is an indication of the usage of higher concentrations of PAH-based compounds at the lakefront during industrial activity (e.g., wood treatment) compared to those used at the former MGP"*. These differences in PAH concentration can be a reflection of the varying MGP process, process inputs, process area of the waste stream, transport mechanism, weathering over time and environment. Other spills of product or waste in the tank car area may have contributed to the make-up of the waste. Other, unknown sources may have had minor contributions. Please clarify.

Response

All samples from the upper bluff/filled ravine were compared to all samples from Kreher Park. This included the samples collected during the RI as well as previous investigations. These are each large data sets not skewed by anomalous outliers.

The samples included those from the upper bluff known to contain free product, as well as samples from the coal tar dump area where sheens were observed in the test pit investigation.

This comment appears to imply that the more than an order of magnitude increase in PAH concentrations in samples from the Kreher Park area compared to the upper bluff can be explained due to process changes at the gas plant, transport mechanisms or weathering. NSPW disagrees. Historic site use at the Lakeshore is a more likely explanation of the higher PAH concentrations in this area compared to the upper bluff area. Assuming that the highest PAH concentrations are associated with the source area, then Kreher Park represents a primary release area. PAH concentrations could not increase to these levels outside the gas plant area without intentional alteration; contaminant mass cannot be gained through natural phenomena. This comment suggests that different gas plant waste streams were disposed at Kreher Park as compared to the upper bluff area. Not only is there no evidence in the record to support this comment's assertion, but there is no information in the historical record that the MGP produced different waste streams.[2]

23. Section 4.2.4 – *Subsurface Soils/Kreher Park* - Organics: All of the VOCs and PAHs (or SVOCs) found to exceed regulatory criteria need to be presented and discussed.

Response

Please see the response to Specific Comment 19 above.

24. Section 4.3.1 – *Upper Bluff/Filled Ravine – Metals and Inorganics – Upper Bluff:* This section indicates that certain metals were detected at low percentages, etc. However, this section does not identify the extent of contamination for arsenic, for example. The fact that arsenic has a very low regulatory standard, and that it may (or may not) be attributed to arsenic soil background concentrations does not preclude the need to characterize its extent. This must be accomplished for each of the metals identified to have exceeded regulatory standards.

[2] An entry in the historic Brown's Directories of nationwide gas production suggests a coal gasification process was utilized at the Ashland gas plant for a small fraction (less than 15 percent) of the total output during one operating year, 1917. No other coal gasification entries appear in the historic record, and no other information regarding this entry have been identified.

Response

Please see the response to Specific Comment 18 above.

25. Section 4.3.1 – *Upper Bluff/Filled Ravine – Metals and Inorganics – Filled Ravine*: The statistical summary does not define the extent of contamination in the shallow groundwater. If the intent is to identify the entire ravine as contaminated with certain metals and cyanide, then this must be spelled out and backed up with supporting figures identifying detected concentrations.

Response

Figures for the compounds mentioned in the statistical summaries will be added to the revised RI report.

26. Section 4.3.1 – *Upper Bluff/Filled Ravine – Organics – Filled Ravine*: This section mentions that other BTEX and PAH compounds also exceeded regulatory standards; however, these are not identified. The extent of contamination needs to be identified for all of the organics found to exceed regulatory standards.

Response

Please see the response to Specific Comment 19.

27. Section 4.3.1 – *Upper Bluff* and Section 4.3.2 - *Kreher Park*: Groundwater (and NAPL) has historically moved from the ravine area to the filled lake bed area. Although the 12" clay tile pipe has been removed as a transport mechanism and EW-4 installed, there has been no study to determine the effectiveness of this interim measure to act as a barrier for groundwater migration through the fill material to Kreher Park. As such the upper bluff, ravine and Kreher Park have to be looked at as being connected.

Response

NSPW agrees with this statement. The areas were divided for discussion purposes because of the obvious differences in geologic conditions

28. Section 4.3.2 – *Kreher Park*: This section needs to identify the extent of contamination for all of the constituents (inorganic and organic) found to exceed regulatory standards. If this is to be interpreted as the entire area of Kreher Park, then this needs to be stated as such. In the organics discussion, the statement regarding the higher concentrations of PAHs in soil is out of place. In this same paragraph, the statement is made that the PAH constituents are widespread throughout Kreher Park, based on the statistics. This evaluation should be conducted on a direct

comparison of concentrations to regulatory standards.

Response

The issue of discussion of all constituents that exceed regulatory standards has been previously addressed (Specific Comment 19 above). A discussion of key contaminants that exceed regulatory standards in groundwater will be added to the revised draft.

29. Section 4.3.3 – *Copper Falls Aquifer*: This comment pertains to groundwater flow within the Copper Falls aquifer, and as such, pertains to Section 3 as well as all other sections dealing with flow and contaminant transport through the Copper Falls aquifer. The Copper Falls aquifer has been described in the RI as semi-confined near the NSPW, and confined underneath the rest of the site to the north. The RI also indicates that there are vertical gradients in the up direction beneath much of the site. Additionally, the RI indicates that groundwater flow in the Copper Falls aquifer converges in the area of Kreher Park. These are apparently the bases to justify that contamination in the Copper Falls aquifer is stagnant and not migrating further.

The vertical gradients in the Copper Falls aquifer are based on head differences of greater than 10 feet in some instances, and do indicate that upward groundwater flow is likely. Based on observations in the boring logs of the deeper Copper Falls wells it is apparent that zones or perhaps lenses of finer grained material are present in this hydrostratigraphic unit that are serving to increase the pore pressures of the deeper aquifer zones within the Copper Falls. The result is that higher heads are evident in the deeper aquifer zones. Similarly, it is likely that lower permeability zones in the Copper Falls aquifer are associated with the elevated heads in the near-shore monitoring wells (MW-24A, MW-25A, and MW-26A). Despite these elevated heads, it is unlikely that hydrostatic pressures would prevent groundwater, and therefore contaminants, from migrating further through the Copper Falls aquifer. The RI implies that groundwater does not migrate past Kreher Park in this aquifer and that these flow conditions mitigate contaminant migration, which is not the case. Lake Superior is without a doubt the ultimate discharge point for the Copper Falls aquifer. To further support that contaminants do and will migrate past the Kreher Park area is the fact that organic contaminants have been detected in wells MW-24A, MW-25A, and MW-26A. The one thing that is not known is how far into the lake the Copper Falls aquifer intersects the lake bottom, and analogously, where contaminants would discharge to the lake. However, such information is not likely to be of great value to the RI at this point, as it appears that only trace to low concentrations of VOCs have been detected along the Lake Superior edge in the Copper Falls aquifer.

Response

This comment does not accurately assess flow conditions. Flow in the Copper Falls Aquifer at the Lakefront Site is a result of the influence of regional flow. Recharge occurs in the upland areas south of Ashland, and discharge occurs at the low lying areas along the Lake Superior

shoreline. These flow conditions are shown on the flownets shown on the cross-sections on Figures 3-2 through 3-7. Isolated fine-grained units within the Copper Falls have no influence on pressure conditions induced by regional recharge. If the Miller Creek Formation were not present as a confining unit, there would be no consequent artesian flow.

Monitoring wells MW-24A, -25A and -26A are screened in the Copper Falls below the base of the Miller Creek Formation. These wells are located along the shoreline. The thickness of the Miller Creek increases from the bluff face (where erosion has caused localized thinning of the unit) toward the lake. Water levels indicate that the potentiometric surface is highest at the upper bluff area, declines toward the center of Kreher Park, but then increases near the shoreline. This indicates regional groundwater flow is to the north, but localized flow between the shoreline and the center of Kreher Park is to the south. These flow conditions create a stagnation zone beneath Kreher Park; which explains the lack of contamination detected in wells installed along the shoreline (in contrast with the statements in the comment, the only organic contaminant detections in these wells have been very low levels of VOCs (immediately above the detection limit) in four rounds of analyses. These flow conditions prevent dissolved phase constituents from discharging to the lake. As described in the comment, this information confirms that the intersection of the Copper Falls Aquifer with the lake has no bearing on the RI.

30. Section 4.4 – *Sediments and Surface Water:* Although an attempt was made to collect a surface water sample apparently after a slick even had subsided, it is evident that the NAPL contamination within the sediments is not stable. Slicks at the site are reported during wave events and are evident during and after "ice out". These releases, or instability of the sediments, needs to be discussed in the narrative.

Response

A discussion regarding observed slicks will be included in the revised draft RI report.

31. Section 4.4.1 – *Sediments – Metals and Inorganics:* As in other sections, the comparison to regulatory standards should be made for each individual result, as opposed to the mean or 95% UCL of each constituent. It is unclear if any of the inorganics exceeded TECs. The statement is made that statistics were not computed for cyanide and selenium for the reference locations. This is somewhat misleading; a better way to state this is that cyanide and selenium were not detected in any of the samples collected at the reference locations. The fact that the BERA indicates other metals or inorganics are not COPCs is inconsequential in this section. The nature and extent section needs to focus on the detections, as opposed to their potential effects on the environment.

Response

Please refer to the responses to General Comments 2 and 3 regarding the use of the mean and 95% UCL. The wording regarding cyanide and selenium at reference stations will be revised.

32. Section 4.4.1 – *Sediments – Organics – VOCs – and Figures 4-23 and 4-24:* This section does not identify where exceedances of VOCs occurred in the sediment. Although it is apparent that VOC concentrations decline with distance from the shoreline, it is not clear if concentrations are below regulatory standards at the outermost sediment sampling locations.

Response

The narrative and figures will be revised to describe the relationship between concentrations and the outermost sediment sampling locations.

33. Section 4.4.1 – *Sediments – Organics – PAHs – and Figures 4-25 through 4-27:* It is unclear what the numbers on Figure 4-25, next to each of the sediment sampling location dots, signify. Please clarify. Based on Figure 4-25 and Figure 4-26, it appears that one point (in yellow) exists at an outer sampling location, indicating that the extent of PAHs is not completely defined in the 0 to 4 ft depth (based on a TEC of 1.61 mg/kg).

Response

The figures erroneously showed naphthalene, not total PAHs. These figures will be revised in the RI report.

34. Section 4.4.2 – *Surface Water:* The text indicates that a few heavy molecular weight PAHs were detected above regulatory standards. Where was this one sample collected (should be shown on a figure), and which compounds were detected above the regulatory standards?

Response

The text and figures will be revised to include this information.

35. Section 4.5.2 – *Evaluation of Indoor Gas Intrusion:* It stated that several iterations of the Johnson and Ettinger model were performed using the soil gas data collected from the vapor probes at the site. Provide the modeling iterations and results in the RI.

Response

The model iterations will be provided and referenced as an Appendix in the revised RI report.

36. Section 4.5.3 – *Indoor Air Sampling Results:* This section states that solvents are likely to have been in use at the site facility building during the indoor air sampling. Can the NSPW document the use of chlorinated solvents in their daily routine? If not, then the indoor air sampling results need to be re-evaluated.

Response

There is no need to reevaluate the indoor air sampling results. Chlorinated solvents have historically and are currently used in many industrial settings. These compounds have not been detected at levels of concern at the Ashland site in other media. The level and distribution of chlorinated hydrocarbons detected in these samples does not warrant further investigation.

37. Section 5.0 – *Contaminant Fate and Transport:* The exclusion of metals in the F&T discussion is not an acceptable approach. The text indicates that the metals are associated with background conditions or were detected at such low levels that they are not COCs. Assuming that the background samples are representative of background conditions and the statistical comparisons are valid, the fact remains that some of the metals were still found at levels above background. Therefore, metals and inorganics should be addressed in the fate and transport discussion.

Response

Historic and RI site investigation results indicate that metals and inorganics are not associated with releases from the Ashland Lakefront Site. A discussion of metals and inorganics was included in Section 4 (Nature and Extent of Contamination), which concluded that these compounds do not present a threat to human health and the environment. Because certain compounds (i.e., arsenic) were found at levels above background does not warrant including a discussion of them in the F&T section.

38. Section 5.0 – *Contaminant Fate and Transport:*

- The report needs to reflect that NAPL was/is present from the MGP to the mouth of the ravine and that the ravine itself, and later through pipes, acted as a transport route.

Response

Please see the response to the fourth bullet of General Comment 5 above.

- The contaminants in the sediments have not "penetrated the sediments" but rather wood waste has been deposited on top the contaminated sediments

Response

Please provide documentation or other support for this comment. NSPW is aware of no evidence which suggests wood waste was placed above contaminated sediments. This comment conflicts with the Agency's position advanced in the fourth bullet of General Comment 5.

- Although some minor other sources can not be ruled out, the investigations over the years have allowed for an understanding of the sources, transport and fate of the COPC at this site.

Response

NSPW disagrees with the characterization of other sources as "minor". Please see the response to General Comment 5.

- It is likely that the clay tile piping system was installed and extended over time by the MGP operators in response to the City of Ashland 1902 ordinance requiring MGPs to convey wastes underground. Any footnote or reference to that ordinance should correctly portray it. The ordinance was directed at MGP wastes. There is no evidence that the piping was part of a larger "city sewer network".

Response

The text of the revised draft RI report will present a discussion of the 1902 ordinance; however, NSPW's review of the ordinance indicates it was part of a larger city-wide series of regulations of which underground conveyance of MGP wastes was one of many items.

The Agency is requested to provide historic records indicating the clay tile was installed by the MGP operators. The physical evidence encountered during the 2005 RI indicates the tile was likely part of a larger sewer system not specific to the MGP.

- Any reference to NAPL volume estimates needs to be supported with the calculations. As past comments on this issue have noted, the percent of pore space filled with NAPL or water needs to be discussed. We believe that the "estimates" greatly exaggerate the

volumes of NAPL in the various areas of the site and may not accurately represent the site conditions and volumes of NAPL present.

Response

Please see the response to the first bullet for General Comment 5 above.

- A conclusion that *"No continuing releases of free-product have occurred since the latest active industrial operations ceased in 1947 with the closing of the MGP. Consequently, the continuing release of contaminants to the environment has likely approached equilibrium conditions"* cannot be supported. Some downward migration continues within the Copper Falls aquifer as witnessed at the MW-4 well nest, whether it is through a man made conduit or naturally through the soils has yet to be determined. A clear hydraulic connection between the Kreher Park lake bed fill and the open lake/sediments has been documented. Slicks indicate transport from the sediments to the open water of the lake. No evidence has been produced to show the lack of a connection between the ravine and the lake bed fill.

Response

The support for the statement is that the MGP ceased operations in 1947. There can be no further releases of MGP wastes to the environment because of this fundamental fact. Later manipulation of waste materials likely occurred during construction operations for the WWTP as well as other activities at the Lakefront. Similarly, free-product continues to be a source for groundwater contamination, but no releases of "new" source material have occurred since closure of the MGP.

MW-4B was first installed in May 1996. The well was installed using drilling mud. The logs noted an extreme odor in a sand unit stained with product from 37½ - 40½ feet. This unit was logged as underlain by a low plasticity clay (plasticity index – 8; liquid limit – 21) from 38½ - 40½ feet. The clay was logged as underlain by silty sand to a depth of 55 feet where the five-foot screen was set. Immediately following installation the well was sampled (June 2006); a value of 430 µg/L of benzene was detected. The next sampling event (September 1997) yielded a non-detect for benzene. Fourteen later rounds were then collected until December 2002; the highest benzene measurement during this period was 78 µg/L, but most measurements were less than 30 µg/L. In March 2003, 3,700 µg/L of benzene was measured. The subsequent four quarterly events (June, September, December 2003 and March 2004) yielded benzene levels of 120, 0.27, 86 and 15,000 µg/L, respectively. Free-product then was measured in June 2004. This data suggests that free-product (DNAPL) that pooled above the clay unit encountered at 37½ feet was in contact with the bentonite annular space seal since 1996, and that this contact eventually resulted in a breakdown of the montmorillonite clays in the seal.

NSPW submitted a record of this information to USEPA in February 2005 and requested that MW-4B should be abandoned and replaced with a deeper, properly installed well. The Agency responded in a February 17, 2005 letter confirming the potential degradation of the well seal, but denying the request for abandonment. However, the thickness of the free-product continued to increase from a trace first measured in June 2004 until November 2005, when nine feet was measured. The Agency then agreed to allow well abandonment, and it was abandoned in March 2006. These conditions are not representative of natural downward migration. The Agency is requested to provide documentation supporting its contrary position.

As stated previously, Section 3.2.2 (Site Hydrogeology) will be augmented to include more detail regarding the groundwater interaction between the Kreher Park lake bed fill and the lake.

39. Section 5.0 – *Contaminant Fate and Transport:* This section does not address the fact that the shallow groundwater, within the fill zone of Kreher Park, will discharge to Chequamegon Bay. Similarly, the RI indicates that the pressures of groundwater in the Copper Falls aquifer have restricted the flow of the plume; however, as discussed in a prior comment, there is no doubt that Lake Superior is the discharge point for the Copper Falls aquifer, and therefore the contaminants within it. These pathways need to be addressed in the fate and transport discussion.

Response

As stated in the previous response, the hydraulic connection between the lake bed fill and the lake will be expanded in Section 3.2.2. The discussion in Section 5 will be expanded to address F&T via this pathway as well. With regard to the Copper Falls Aquifer, please see the response to Specific Comment 29.

40. Section 5.0 – *Contaminant Fate and Transport:* This section indicates that the free product within the Copper Falls aquifer is not likely to migrate further, in part due to natural conditions, and in part due to the extraction system. One possibility that has not been addressed is that a DNAPL may already be present at depth in or near the NSPW source area. This is based on the elevated total VOC concentration found in MW-9C. All arguments in the RI lead the reader to believe that upward flow is controlling the distribution of the free product and associated dissolved plume. But this does not account for the presence of VOCs at elevations down to 480 ft MSL (MW-9C), as well as lower concentration detections in MW-2C at 440 ft MSL. Regardless of flow gradient, a DNAPL will be able to flow straight down against the gradient and will be able to act as a source of dissolved VOCs at these deeper depths. This needs to be addressed further in the fate and transport section and it also raises the question, is the extent of contamination in the Copper Falls aquifer defined at depth?

Response

As described in the response to General Comment 5, groundwater monitoring results indicate that when NAPL is present, total VOCs are detected in groundwater samples at elevated concentrations (i.e. above 50,000 µg/l). Benzene, the most predominant VOC at the Ashland site, was detected in MW-9C samples at low concentrations (the initial event during September 2000 yielded a value of 580 µg/L; 18 successive events yielded values no higher than 63 µg/L, the majority of these measurements less than 10 µg/L). Additionally, low concentrations have also been detected in samples collected from deep piezometers MW-13C and MW-13D located beneath the DNAPL plume.

Literature often shows DNAPL plumes migrating vertically to the bedrock horizon. However, strong upward vertical gradients have been measured at the MW-2 and MW-13 well nests. These strong upward gradients prevent the vertical migration of this DNAPL at the Ashland site under the influence of gravity. The DNAPL at the site was derived from water gas processes. Specific gravities of water gas tars typically range from 1.02 – 1.04 g/cc.[3] *Near the source area, DNAPL has migrated into the Copper Falls because the mass of DNAPL has overcome the upward vertical gradients at the release area. The interim response extraction wells have recovered over 8,000 gallons of DNAPL since operation began in late 2000. Away from the source area in the downgradient direction, DNAPL has been encountered only in the upper Copper Falls near the Miller Creek/Copper Falls contact. At MW-2C a benzene concentration of 9.1 µg/L was measured in December 2003 immediately following installation. Five subsequent quarterly events yielded benzene levels no higher than 0.27 ug/L (the highest VOC measured during any of these events was toluene at 18 µg/L). This condition occurs because strong upward vertical gradients prevent downward migration.*

41. Section 5.1 and Appendix D4: It is stated in this report based on the free product analysis from the Copper Falls aquifer benzene and naphthalene are the primary constituents. Based on results presented in Appendix D4, this appears to be based on the sample collected from EW-1 which was analyzed for VOCs, SVOCs and metals. Also, COC for this sample identifies this sample to be a groundwater sample and a remark has been made that there was a strong fuel odor and free product in EW-1. Also in Appendix D4, two oil samples have been provided which has been identified as oil samples in the COCs. The oil samples were analyzed for VOCs and selected metal constituents. Based on the review of the analytical results of EW-1, and oil samples (D1 and D4), the results for VOCs in oil is a thousand times higher than EW-1. This suggests that samples from EW-1 were groundwater samples probably collected from a close proximity to NAPL. Therefore, the concentrations in the sample most likely represent concentrations of dissolved constituents in the groundwater in the vicinity of the NAPL.

[3] Please note that a specific gravity analyses on a sample of free-product collected from extraction well EW-2 during 2000 yielded a specific gravity of 0.97 g/cc, likely due to the dominance of the light fraction in that sample.

Therefore, the primary constituents list should be expanded to include constituents that exceed regulatory standards.

Response

The sample collected from EW-1 in September 1997 was collected during the EW-1 pump test and included water with "free product" (DNAPL). The D1 and D2 (not D4 as stated above) samples of oil were collected in October 2000 following installation of the free-product recovery system (into which EW-1 was incorporated). In both samples, benzene and naphthalene were detected at elevated concentrations. Concentrations of these constituents were higher in the October 2000 sample (pure DNAPL) compared to the September 1997 sample (DNAPL/water mixture). Benzene and naphthalene are described as "primary constituents" because they comprise a significant mass of the pure DNAPL and the DNAPL/water mixture extracted from EW-1. With respect to contaminant mass, exceedance of individual regulatory standards should not be used to select "primary constituents". Groundwater quality standards are numeric risk based values. Known carcinogens have the most stringent regulatory standards, and consequently exceed their respective standards more often than non-carcinogens (benzene is considered a carcinogen, whereas naphthalene is not). Constituents of regulatory concern are adequately described elsewhere in the RI Report.

42. Section 5.2 – *Potential Routes of Migration/Contaminant Transport Processes*: This section addresses the migration pathways that have distributed free product throughout the investigation area. This section does not address the potential migration pathways that would convey contaminants now and in the future. This is related to the fact that the RI contends that contaminants are not migrating, which is not likely to be the case. Dissolved constituents will move through advection and dispersion in the groundwater media, and free product (DNAPL) as mentioned above, is still likely to migrate through permeable media (Copper Falls). The migration of contaminants in groundwater, as well as other media, needs to be discussed in this section.

Response

This section identifies estimated volumes of free-phase hydrocarbons at the Site, and states that free-phase hydrocarbons are the "primary sources for dissolved phase compounds" in the backfilled ravine, in the Copper Falls aquifer and at Kreher Park. It is also stated in this section that there is "no continuous release" because MGP operations ceased in 1947, industrial operations at Kreher Park ceased in the late 1930s, and construction operations at the lakefront ceased in the 1980s. Since that time, site investigation results indicate that contaminant distribution (free-phase and dissolved phase) at these areas has reached equilibrium conditions.[4]

[4] As described in the Conceptual Site Model in Section 6, activities at Kreher Park in the 1950's during the initial construction of the WWTP, its expansion during the 1970's and marina development in the 1980's likely resulted in a manipulation and redistribution of the contaminants released to the environment during earlier decades of the 20th

Identification of the lateral and vertical extent of contamination and the evaluation of hydrogeologic conditions supports this conclusion. With the exception of DNAPL currently being removed from existing extraction wells, there is no indication that contaminants are continuing to migrate, or will migrate in the future. Hydrogeologic conditions further confirm that migration of contaminants is either restricted by natural hydraulic barriers (i.e., flow in the Copper Falls Aquifer) or dilution conditions in surface water (Chequamegon Bay).

43. Section 5.3 – *Contaminant Distribution and Trends:* The paragraph addressing MW-1(NET) indicates that there are steady state conditions in the shallow aquifer in Kreher Park. This statement is based on the consistently high detections of benzene in MW-1(NET). This well is located within the Former Coal Tar Dump and consistently high results should be expected as contamination in the form of free product is still present in this area and serves as a persistent source. This does not mean that the area is under steady state conditions; it just means that high concentrations are consistently detected in this well. Similarly, the following paragraph indicates that MW-2B(NET) is at the leading edge of the plume, with a total VOC concentration of greater than 38,000 ug/L. This concentration is more indicative of the center of a plume, not of a leading plume edge. Additionally, there are no downgradient wells from MW-2B(NET), therefore, it cannot be determined if this is the extent of contamination (wells MW-25A and MW-24A are about 450 ft apart and not considered to be directly downgradient).

Response

Contamination in the former coal tar dump area has resulted in consistently high detections of benzene detected in well MW-1(NET) samples indicating that NAPL in this area behaves as a source for dissolved phase groundwater contamination as described in the response to comment number 42. However, contaminant concentrations are not increasing indicating that contaminants are not migrating from this area. There is no driving force to move contaminants; the horizontal hydraulic gradients in the Kreher Park fill are flat. This further supports the conclusion that the contamination at Kreher Park has reached equilibrium conditions.

The report states that well MW-2B(NET) "intersects the leading edge of the dissolved phase plume north of the free-product mass." The final RI report will be revised to clarify that the leading edge of the plume is located between the MW-2(NET) well nest and the shoreline. This relationship is shown on the cross-sections B-B' referenced in that section, and on cross-section C-C'.

44. Footnote 45: The foot note indicates that results have been inadvertently reversed in wells MW-2A(NET) and MW-2B(NET). Consider fixing this in the database and on the figures to avoid presenting potentially misleading graphs (Figure 5-5).

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century. Although continued diffusion of contaminants from the free-product masses will continue, NSPW's evaluation of environmental conditions indicates that the dissolved phase plumes are stable and equilibrium conditions of these contaminant masses have been reached.

Response

This footnote was added to explain that the misidentification of the shallow and deep piezometers resulted in the observed trend reversal in 2000 and 2001. Information included in the database and shown on Figures is correct.

45. Section 5.3 – *Contaminant Distribution and Trends:* The last paragraph in this section lists MW-2C, which is a typographical error - it appears this should be MW-9C.

Response

The text should refer to MW-9C, not MW-2C. This typographical error is noted, and will be corrected in the final RI Report.

46. Section 6.0 – *Conceptual Site Model:* This section essentially summarizes the history of the site and presents how free product was transported. This section omits any discussion of the existing or potential contaminant migration pathways, such as through groundwater, from soil to groundwater, from groundwater/soil to vapor, etc. The CSM should present enough information for the reader to identify how contaminants migrate at the site. One suggestion is to include a series of block diagrams that show the development of the site through time. For example, the first diagram might show the MGP site discharging wastes through the open ravine directly to the Bay; the next diagram might show the lumber operations and filling occurring in the former Bay. The last diagram should present the current conditions and all of the migration pathways. Another aspect to the CSM is to consider listing and discussing the potential receptors based on the exposure routes.

All comments need to be incorporated into a revised RI report. This should produce changes in the conceptual site model.

Response

Comments to the draft RI Report will be incorporated into the revised RI report as described in our response to these comments. The CSM was prepared utilizing available historical documents, historical site investigation results, and RI site investigation results. It is intended to present an accurate and realistic explanation of existing site conditions. As discussed at the October 12th meeting, the CSM will be revised to incorporate the findings of the SSA report.

47. Table 2-3: Summary of Groundwater Sampling Field Parameters - A number of the conductivity measurements from March 2005 appear to be in units of mS/cm, instead of uS/cm. Therefore, they appear to be 1000 times too small. Please verify and change as appropriate.

Response

Table 2-3 will be revised to report all conductivity measurements in the same units (uS/cm).

48. Figure 1-3: Add the clay tile pipe that runs from the MGP to the mouth of the ravine.

Response

Figure 1-3 exclusively shows MGP features. A metal pipe was encountered between the existing building (former MGP) and the former tar well, and that pipe segment will be added to Figure 1-3.

Other clay pipes were encountered north of St. Claire Street and at Kreher Park. A clay pipe was encountered near the base of the backfilled ravine between the former seep area and St. Claire Street. This clay pipe appears to terminate at St, Claire Street; it could not be traced beyond St. Claire Street during the 2001 excavations. Free-product was encountered inside this pipe. As described in the CSM in Section 6, this clay pipe network is likely part of a storm sewer network installed by the City. Because there is no conclusive evidence that the clay pipe was part of the MGP, it should not be included on Figure 1-3. However, this clay pipe and clay pipes encountered at Kreher Park will be added to Figure 1-2 (Site Features).

49. Figure 3-3: The northern most contaminant concentration shown is at MW-2A/2B in the Copper Falls aquifer. The concentration lines have been terminated just beyond this well cluster; however, there is no data further downgradient to show that the concentrations decline this close to the well. At a minimum, the isoconcentration lines should be extended further to the north and dashed to identify interpretation.

Response

Figure 3-3 shows the 1,000 and 10,000 µg/l isoconcentration contours for total VOCs terminating north of MW-2A/2B (NET). Evidence to support this interpretation includes groundwater samples collected from the deep piezometer (MW-2A), the increasing thickness of the Miller Creek formation to the north, and the hydraulic conditions measured to the north. Samples collected from down gradient piezometer MW-25A also support this interpretation (see Figure 3-4.) Revision of this figure is not warranted.

50. Figure 3-3: There is no basis shown on this figure to curl the left-most (northern) edge of the 610 ft contour to the top of the Copper Falls aquifer. Nor to show a flow line pointing toward the south (see also Section 4.3.3. comment).

Response

Figure 3-4 accurately depicts regional groundwater flow conditions. The potentiometric surface at MW-25A is 613.90 (shown on Figure 3-3), which indicates that the potentiometric surface rises to the north. "Curling" of the 610 foot contour and "pointing" the flow line to the south accurately depicts regional groundwater flow conditions as described in the response to the comment on Section 4.3.3 above.

Also, Add DNAPL along the complete base of the ravine (based on historical samples, D&M borings 1995). DNAPL in the Copper Falls Aquifer should be extended out to the MW-4B screen.

Response

The lateral extent of DNAPL is shown on Figure 3-3 where it was encountered in all wells during the most recent measurements in November 2005. With regard to revising this Figure, please see the responses to the 4th bullet to General Comment 5 and the 6th bullet to Specific Comment 38. Based on the information in these responses, there is no justification at this time to revise this Figure.

51. Figure 3-7: The head in MW-13B is shown to be 623.45, yet this elevation falls between the 620 and 621 isocontours. The isocontours should be redrawn accordingly.

Response

This error has been noted, and the isoconcentration contours will be redrawn accordingly.

52. Figure 4-1: DNAPL in the filled ravine should extend the full length of the filled ravine. D&M Borings, excavations and extraction well results.

Response

The green line on Figure 4-1 shows the lateral extent of DNAPL encountered in the fill during the recent RI investigation. DNAPL has historically been detected in wells TW-13 and MW-2R. However, DNAPL has not been detected in TW-13 since 2002. DNAPL was not detected in well MW-2, but was detected in MW-2R; this replacement well was installed after the clay pipe excavation. Regardless, a dashed circle will be placed around MW-2R to indicate DNAPL at the base of the backfilled ravine at this location. (See response to comment the 4th bullet to general comment 5 above.)

53. Figure 4-2: NAPL should be depicted at all locations (borings, test pits and wells) where NAPL was detected in any/all samples. All but 3 (or is it 2) test pits in Kreher Park indicate NAPL yet neither the figures nor narrative reflect that.

Response

Figure 4-2 shows free-product in terms of heavy-weight DNAPL identified in borings and monitoring wells. As described in response to General Comment 5 above, LNAPLs visible as sheens were encountered in all but three test pits, and the narrative in the RI Report describes the presence of these sheens in the test pits, as well as the corroborating groundwater analyses as a basis for the interpretation discussed. The lateral extent of DNAPL shown on this figure relies on associated groundwater analyses data to confirm the presence of DNAPL by means of detected VOCs concentrations. In accordance with the Agency discussions at the October 12^{ih} meeting, the figures will be revised to reflect the observations made in the test pits.

54. Figure 4-4: This figure presents arsenic detections in soil by detected ranges. The apparent intent of this and subsequent figures is to present the extent of contamination in the various surface and subsurface soils. However, the concentration ranges neglect the regulatory standards. For instance, in Figure 4-4, the lowest range is from 0.0 (presumably non-detect results) to 1.4 mg/kg, but the Wisconsin standard for arsenic is 0.039 mg/kg. Therefore, it is not feasible to identify the samples that are less than the Wisconsin standard, and consequently the extent of contamination cannot be accurately depicted. This comment pertains to each of the figures that show contaminant concentration ranges in section 4. These figures should be revised and should also include the actual defined extent of contamination with solid and dashed lines where the extent is not fully defined.

Response

The RCL (per Wisconsin Admin. Code NR 720) for arsenic for residential properties is 0.039 mg/kg; the RCL for industrial properties is 1.6 mg/kg. As described in the response to Specific Comment 15 above, if arsenic contamination originated at the gas plant, levels above background in the ravine fill soils would be expected. Because arsenic is a naturally occurring compound, and exceeds Wisconsin clean up standards for industrial and residential properties in background samples, NR 720.11(5)(b) recommends the use of background concentrations as clean up standards. With the exception of identifying break points at the regulatory standards, modifications to the figure are not warranted.

55. Figure 4-10: Based on the elevated detections of arsenic, in SS-2, SS-4, and SS-7, for example, the extent of arsenic in surface soils has not been fully characterized. Additional sampling is likely to be required to complete the extent characterization.

Response

See response to comment 54 above.

56. Figure 4-14: The extent of arsenic contamination does not appear to be delineated at the base of the filled ravine. Depending on the actual concentrations of arsenic in samples near the WWTP as compared to regulatory criteria, arsenic may also not be delineated in this area.

Response

See response to comment 54 above.

57. Figure 4-15: The extent of lead contamination may not be delineated. This depends on the regulatory criteria used as a comparison criteria. If a value of 50 mg/kg is used, then lead is not delineated near TP-1 and TW-12, and to the north of these locations.

Response

Lead is also a naturally occurring compound, and all soil at Kreher Park are fill soils. Lead in surface soil samples is likely a characteristic of the fill material, and not associated with DNAPL related contamination elsewhere on site.

58. Figure 4-16: The benzene concentrations are not delineated near TP-1, TP-4, TP-5, TP-8, and TW-1. Similarly, on Figure 4-17, naphthalene does not appear to be delineated at a number of different boring/sampling locations.

Response

Figures 4-16 and 4-17 delineate benzene and naphthalene contamination in subsurface soil. Exploration test pits completed at Kreher Park indicate that fill soil overlying a wood waste layer was encountered throughout the park. Surface soil samples collected at each test pit location were analyzed for VOCs and SVOCs, and these results verify that the soil overlying the wood waste layer is innocuous fill. Contamination was encountered in the wood waste layer at all but three test pit locations. With the exception of test pits excavated near the former coal tar dump area, contamination was only encountered in the wood waste layer. At nearly every location, seepage occurred into the test pit when the wood waste layer was encountered indicating that contamination at Kreher Park is present in the saturated zone. The lateral extent of benzene and naphthalene in groundwater at Kreher Park are shown on Figures 4-21 and 4-22, respectively.

59. Figure 4-23 through 4-27: Rather than depict the contaminant concentrations related to depth of sediment, please depict it based on the elevation of the historic lakebed.

Response

These figures show the lateral and vertical extent of contamination in off-shore sediments in accordance with the approved Work Plan and AOC. If needed, the sample depth data can be converted to elevation data during the remedial design phase after the ROD is issued.

60. Appendix A: The RAO should address free product including smear zone in the upper bluff, Kreher Park and Bay area.

Response

The Agency is requested to clarify this comment.

61. Appendix A: The RAOs should be revised to address revisions to the RI, Human Health Risk Assessment and Ecological Risk Assessment. Thorough review of the RAOs will be performed once the Human Health Risk Assessment and Ecological Risk Assessment are in good shape.

Response

The RAOs will be revised accordingly.